WHAT IS CLAIMED IS:

1. A method of making a heterogeneous building block array, the method comprising:

forming a plurality of spots on a solid support, the spots comprising a plurality of building blocks; and

immobilizing building blocks to the support in the spots by covalent coupling, by an ionic interaction, or by a combination thereof.

2. The method of claim 1, wherein immobilizing comprises covalent coupling.

3. The method of claim 2, wherein:

the support comprises an amine nitrogen and the building block comprises a carbonyl carbon;

the support comprises a carbonyl carbon and building block comprises an amine nitrogen;

or combination thereof.

4. The method of claim 1, wherein immobilizing comprises ionic interaction.

5. The method of claim 4, wherein:

the support comprises a carboxylate and the building block comprises an ammonium;

the support comprises an ammonium and the building block comprises a carboxylate;

or combination thereof.

6. The method of claim 4, wherein the support comprises amine, quaternary ammonium, ferrocene, or mixture thereof.

7. The method of claim 4, wherein the support comprises carboxylate, phenol substituted with strongly electron withdrawing group, phosphate, phosphonate phosphinate, sulphate, sulphonates, thiocarboxylate, hydroxamic acid, or mixture thereof.

8. The method of claim 4, wherein the building block comprises amine, quaternary ammonium, ferrocene, or mixture thereof.

9. The method of claim 4, wherein the building block comprises carboxylate, phenol substituted with strongly electron withdrawing group, phosphate, phosphonate phosphinate, sulphate, sulphonates, thiocarboxylate, hydroxamic acid, or mixture thereof.

10. The method of claim 1, further comprising mixing a plurality of building blocks and employing the mixture in forming the plurality of spots.

11. The method of claim 1, wherein the solid support comprises a glass plate or microscope slide.

12. A method of making a receptor surface, the method comprising:

forming a region on a solid support, the region comprising a plurality of building blocks; and

immobilizing building blocks to the support in the spots by covalent coupling, by an ionic interaction, or by a combination thereof.

13. The method of claim 12, further comprising mixing a plurality of building blocks and employing the mixture in forming the receptor surface.

14. A method of making an artificial receptor, the method comprising:

forming a region on a support, the region comprising a plurality of building blocks;

coupling building blocks to the support in the region by covalent coupling, by an ionic interaction, or by a combination thereof.

15. The method of claim 14, wherein the region is a spot.

16. A composition comprising:

a support; and

a portion of the support comprising a plurality of building blocks;

building blocks being immobilized on the support by covalent coupling, by an ionic interaction, or by a combination thereof.

17. The composition of claim 16, comprising building blocks immobilized by covalent coupling.

18. The composition of claim 17, comprising building blocks immobilized by acetal linkage, ketal linkage, disulfide linkage, ester linkage, or combination thereof.

19. The composition of claim 17, wherein:

the support comprises an amine nitrogen and the building blocks comprise a carbonyl carbon;

the support comprises a carbonyl carbon and the building blocks comprise an amine nitrogen;

or combination thereof.

20. The composition of claim 16, comprising building blocks immobilized by ionic interaction.

21. The composition of claim 20, wherein:

the support comprises a carboxylate and the building blocks comprise an ammonium;

the support comprises an ammonium and the building blocks comprise a carboxylate;

or combination thereof.

22. The composition of claim 20, wherein the support comprises amine, quaternary ammonium, ferrocene, or mixture thereof.

23. The composition of claim 20, wherein the support comprises carboxylate, phenol substituted with strongly electron withdrawing group, phosphate, phosphonate phosphinate, sulphate, sulphonates, thiocarboxylate, hydroxamic acid, or mixture thereof.

24. The composition of claim 20, wherein the building block comprises amine, quaternary ammonium, ferrocene, or mixture thereof.

25. The composition of claim 20, wherein the building block comprises carboxylate, phenol substituted with strongly electron withdrawing group, phosphate, phosphonate phosphinate, sulphate, sulphonates, thiocarboxylate, hydroxamic acid, or mixture thereof.

26. The composition of claim 16, comprising a candidate artificial receptor, a lead artificial receptor, a working artificial receptor, or a combination thereof.

27. The composition of claim 24, wherein the artificial receptor comprises 2, 3, 4, 5, or 6 different building blocks.

28. The composition of claim 16, comprising a plurality of spots on the support;
the spots comprising a plurality of building blocks; and
the building blocks being coupled to the support.

29. The composition of claim 23, wherein the spots are configured in an array.

30. The composition of claim 29, wherein the array comprises more than 1 million spots.

31. The composition of claim 28, wherein the spots comprise 2, 3, 4, 5, or 6 building blocks.

32. The composition of claim 28, wherein the support comprises a solid support.

33. The composition of claim 32, comprising a plurality of spots on a surface of the solid support.

34. The composition of claim 28, comprising a functionalized lawn coupled to the support and the building blocks immobilized in spots to the lawn.

35. The composition of claim 34, comprising building blocks immobilized by covalent coupling.

36. The composition of claim 35, comprising building blocks immobilized by acetal linkage, ketal linkage, disulfide linkage, ester linkage, or combination thereof.

37. The composition of claim 35, wherein:

the functionalized lawn comprises an amine nitrogen and the building blocks comprise a carbonyl carbon;

the functionalized lawn comprises a carbonyl carbon and the building blocks comprise an amine nitrogen;

or combination thereof.

38. The composition of claim 34, comprising building blocks immobilized by ionic interaction.

39. The composition of claim 38, wherein:

the functionalized lawn comprises a carboxylate and the building blocks comprise an ammonium;

the functionalized lawn comprises an ammonium and the building blocks comprise a carboxylate;

or combination thereof.

40. The composition of claim 38, wherein the functionalized lawn comprises amine, quaternary ammonium, ferrocene, or mixture thereof.

41. The composition of claim 38, wherein the functionalized lawn comprises carboxylate, phenol substituted with strongly electron withdrawing group, phosphate, phosphonate phosphinate, sulphate, sulphonates, thiocarboxylate, hydroxamic acid, or mixture thereof.

42. The composition of claim 38, wherein the building block comprises amine, quaternary ammonium, ferrocene, or mixture thereof.

43. The composition of claim 38, wherein the building block comprises carboxylate, phenol substituted with strongly electron withdrawing group, phosphate, phosphonate phosphinate, sulphate, sulphonates, thiocarboxylate, hydroxamic acid, or mixture thereof.

44. The composition of claim 43, comprising a functionalized glass support.

45. The composition of claim 43, wherein:
the support comprises a surface;
the surface comprises a region; and
the region comprises a plurality of building blocks;
the building blocks being coupled to the support.

46. The composition of claim 45, wherein the support comprises a tube or well.

47. The composition of claim 45, further comprising a functionalized lawn coupled to the tube or well and the building blocks immobilized to the lawn.

48. A heterogeneous building block array comprising:
a support; and

a plurality of spots on the support;

the spots comprising a plurality of building blocks; and

building blocks being immobilized on the support by covalent coupling, by an ionic interaction, or by a combination thereof.

49. A composition comprising:

a surface; and

a region on the surface comprising a plurality of building blocks;

building blocks being immobilized on the support by covalent coupling, by an ionic interaction, or by a combination thereof.

50. A composition comprising:

a support; and

a portion of the support comprising a plurality of building blocks;

building blocks being immobilized on the support by covalent coupling, by an ionic interaction, by hydrophobic interaction, or by a combination thereof.

51. The composition of claim 50, comprising building blocks immobilized by hydrophobic interaction.

52. The composition of claim 51, wherein the support and building blocks comprise independently branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof.

53. The composition of claim 50, comprising building blocks immobilized by hydrophobic interaction and by covalent coupling.

54. The composition of claim 53, comprising building blocks immobilized by hydrophobic interaction; and acetal linkage, ketal linkage, disulfide linkage, ester linkage, or combination thereof.

55. The composition of claim 53, wherein the support comprises branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof; and carbonyl carbon, amine nitrogen, thiol, alcohol, carboxyl group, or combination thereof.

56. The composition of claim 53, wherein the building block comprises branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof; and carbonyl carbon, amine nitrogen, thiol, alcohol, carboxyl group, or combination thereof.

57. The composition of claim 50, comprising building blocks immobilized by hydrophobic interaction and by ionic interaction.

58. The composition of claim 57, wherein the support comprises branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof; and positively charged moiety.

59. The composition of claim 58, wherein the building block comprises branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof; and negatively charged moiety.

60. The composition of claim 57, wherein the support comprises branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof; and negatively charged moiety.

61. The composition of claim 60, wherein the building block comprises branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof; and positively charged moiety.

62. The composition of claim 50, comprising a functionalized lawn coupled to the support and the building blocks immobilized in spots to the lawn.

63. The composition of claim 62, comprising building blocks immobilized by hydrophobic interaction.

64. The composition of claim 63, wherein the lawn and building blocks comprise independently branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof.

65. The composition of claim 62, comprising building blocks immobilized by hydrophobic interaction and by covalent coupling.

66. The composition of claim 65, comprising building blocks immobilized by hydrophobic interaction; and acetal linkage, ketal linkage, disulfide linkage, ester linkage, or combination thereof.

67. The composition of claim 65, wherein the lawn comprises branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof; and carbonyl carbon, amine nitrogen, thiol, alcohol, carboxyl group, or combination thereof.

68. The composition of claim 65, wherein the building block comprises branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof; and carbonyl carbon, amine nitrogen, thiol, alcohol, carboxyl group, or combination thereof.

69. The composition of claim 62, comprising building blocks immobilized by hydrophobic interaction and by ionic interaction.

70. The composition of claim 69, wherein the lawn comprises branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted

C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof; and positively charged moiety.

71. The composition of claim 70, wherein the building block comprises branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof; and negatively charged moiety.

72. The composition of claim 69, wherein the lawn comprises branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof; and negatively charged moiety.

73. The composition of claim 72, wherein the building block comprises branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof; and positively charged moiety.

74. An article of manufacture comprising:

a support, a functionalized lawn reagent, and a plurality of building blocks;

the functionalized lawn being configured to be coupled to the support;

the plurality of building blocks being configured to be immobilized to the lawn by covalent coupling, by an ionic interaction, or by a combination thereof.

75. The article of manufacture of claim 74, wherein the functionalized lawn reagent comprises a first covalent bonding moiety and the building block comprises a second covalent bonding moiety.

76. The article of manufacture of claim 74, wherein the functionalized lawn reagent comprises a first charged moiety and the building block comprises a second charged moiety, the first and second charged moieties having opposite charges.

77. The article of manufacture of claim 74, comprising a functionalized glass support.

78. An article of manufacture comprising:

a support, a functionalized lawn reagent, and a plurality of building blocks;

the functionalized lawn being configured to be coupled to the support;

the plurality of building blocks being configured to be immobilized to the lawn by covalent coupling, by an ionic interaction, by hydrophobic interaction, or by a combination thereof.

79. The article of manufacture of claim 78, wherein the functionalized lawn reagent comprises a first lipophilic moiety and the building block comprises a second lipophilic moiety.

80. A method of making a heterogeneous building block array, the method comprising:

forming a plurality of spots on a solid support, the spots comprising a plurality of building blocks; and

immobilizing building blocks to the support in the spots by covalent coupling, by an ionic interaction, hydrophobic interaction, or by a combination thereof.

81. The method of claim 80, comprising immobilizing building blocks by hydrophobic interaction.

82. The method of claim 81, wherein the support and building blocks comprise independently branched or straight chain, substituted or unsubstituted C_{6-36} alkyl; branched or straight chain, substituted or unsubstituted C_{6-36} alkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} alkynyl with 1 to 4 triple bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkyl; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkenyl with 1 to 4 double bonds; branched or straight chain, substituted or unsubstituted C_{6-36} arylalkynyl with 1 to 4 triple bonds; polyaromatic hydrocarbon; substituted or unsubstituted cycloalkane; or mixtures thereof.